

# Patent Claims :

5 1. An electrical device for self-clocked controlled pseudo random noise (PN) sequence generation and comprising a plurality of sequence generation means (201) adapted to:

- output a plurality of sequence values ( $Z_t$ ) on the basis of a plurality of clock values ( $C_t$ ),

10 characterized in that said electrical device further comprises:

- step pattern generation means (202) adapted to select a step pattern, comprising said plurality of clock values ( $C_t$ ), from a plurality of possible step patterns on the

15 basis of a step pattern select signal ( $W_t$ ).

2. An electrical device according to claim 1, characterized in that said step pattern select signal ( $W_t$ ) is derived on the basis of a combined value

20 ( $U_t$ ) and one or more previously derived step pattern select signals ( $W_{t-1}$ ).

3. An electrical device according to claim 2, characterized in that

25 • said plurality of sequence generation means (201) is further adapted to output a plurality of step control values ( $u_t$ ), and

- said combined value ( $U_t$ ) is provided on the basis of said plurality of step control values ( $u_t$ ) and on the

30 basis of a plurality of prior clock values ( $C_{t-1}$ ).

4. An electrical device according to claim 2 or 3, characterized in that the number of said

35 plurality of possible step patterns is 6, and in that

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said pattern select signal ( $W_t$ ) is derived as:  $U_t + W_{t-1} \text{ MOD } 6$ .

5. An electrical device according to claim 2 or 3,  
 5 c h a r a c t e r i z e d in that the number of said plurality of possible step patterns is 6, and in that said pattern select signal ( $W_t$ ) is derived as:  $U_t + a_1 W_{t-1} + a_2 W_{t-2} + a_3 W_{t-3} \text{ MOD } 6$ , where  $a_1$ ,  $a_2$ , and  $a_3$  are pre-selected constants.
- 10 6. An electrical device according to claim 2 or 3, c h a r a c t e r i z e d in that if the number of said plurality of possible step patterns is not a prime number, then said pattern select signal ( $W_t$ ) is derived  
 15 on the basis of said combined value ( $U_t$ ) and said previously derived step pattern select signals ( $W_{t-1}$ ) using a Chinese remaindering technique.
- 20 7. An electrical device according to claims 1 - 6, c h a r a c t e r i z e d in that said plurality of possible step patterns is:  $(0,0,1,1)$ ,  $(0,1,0,1)$ ,  $(1,0,0,1)$ ,  $(0,1,1,0)$ ,  $(1,0,1,0)$ ,  $(1,1,0,0)$ .
- 25 8. An electrical device according to claims 1 - 7, c h a r a c t e r i z e d in that said device further comprises function generating means (203) adapted to calculate an output value ( $Out_t$ ) as the sum of said plurality of sequence values ( $Z_t$ ) MOD 2.
- 30 9. An electrical device according to claims 1 - 8, c h a r a c t e r i z e d in that said plurality of sequence generation means is m-sequence generators.
- 35 10. An electrical device according to any one of the previous claims, c h a r a c t e r i z e d in that said device is used in a mobile telephone.

11. A method of self clock controlled pseudo random noise (PN) sequence generation, comprising the step of:

- outputting a plurality of sequence values ( $Z_t$ ) on the basis of a plurality of clock values ( $C_t$ ),

characterized in that said method further comprises the step of:

- selecting a step pattern, providing said plurality of clock values ( $C_t$ ), from a plurality of possible step patterns on the basis of a step pattern select signal ( $W_t$ ).

12. A method according to claim 11, characterized in that said step pattern select signal ( $W_t$ ) is derived on the basis of a combined value ( $U_t$ ) and one or more previously derived step pattern select signals ( $W_{t-1}$ ).

13. A method according to claim 12, characterized in that

- a plurality of step control values ( $u_t$ ) is output, and
- said combined value ( $U_t$ ) is provided on the basis of said plurality of step control values ( $u_t$ ) and on the basis of a plurality of prior clock values ( $C_{t-1}$ ).

14. A method according to claim 12 or 13, characterized in that the number of said plurality of possible step patterns is 6, and in that said pattern select signal ( $W_t$ ) is derived as:  $U_t + W_{t-1} \text{ MOD } 6$ .

15. A method according to claim 12 or 13, characterized in that the number of said plurality of possible step patterns is 6, and in that said pattern select signal ( $W_t$ ) is derived as:  $U_t + a_1 W_{t-1} + a_2 W_{t-2}$ .

+  $a_3 W_{t-3} \text{ MOD } 6$ , where  $a_1$ ,  $a_2$ , and  $a_3$  are pre-selected constants.

16. A method according to claim 12 or 13, c h a r a c -  
 5 t e r i z e d in that said pattern select signal ( $W_t$ ) is  
 derived on the basis of said combined value ( $U_t$ ) and said  
 previously derived step pattern select signals ( $W_{t-1}$ )  
 using a Chinese remaindering technique, if the number of  
 said plurality of possible step patterns is not a prime  
 10 number.

17. A method according to claims 11 - 16, c h a r a c -  
 t e r i z e d in that said plurality of possible step  
 patterns is: (0,0,1,1), (0,1,0,1), (1,0,0,1), (0,1,1,0),  
 15 (1,0,1,0), (1,1,0,0).

18. A method according to claims 11 - 17, c h a r a c -  
 t e r i z e d in that said method further comprises the  
 step of calculating a value ( $Out_t$ ) as the sum of said  
 20 plurality of sequence values ( $Z_t$ ) MOD 2.

19. A method according to claims 11 - 18, c h a r a c -  
 t e r i z e d in that said plurality of sequence values  
 ( $Z_t$ ) is generated by a plurality of m-sequence  
 25 generators.

20. A method according to claims 11 - 19, c h a r a c -  
 t e r i z e d in that said method is used in a mobile  
 telephone.

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